

4

# **Notice of Allowability**

**Application No.**

09/919,998

**Examiner**

Elizabeth Keaney

**Applicant(s)**

HORI, TSUNENOBU

**Art Unit**

2882

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment and remarks filed 25 May 2004.
2. ☒ The allowed claim(s) is/are 1-4,6,8 and 10.
3. ☒ The drawings filed on 06 November 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## **Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

### **DETAILED ACTION**

Receipt is acknowledged of the Amendments and Remarks filled 25 May 2004.

#### ***Allowable Subject Matter***

Claims 1-4,6,8 and 10 are allowed over the prior art.

The following is an examiner's statement of reasons for allowance:

Re claims 1-3: The best prior art of record discloses a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a chip including a noble metal arranged at the end surface of a base material and a weld portion between the base material and the chip including first to nth weld layers formed by material of the chip and the base material. However, the prior art fails to teach or fairly suggest a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a chip including a noble metal arranged at the end surface of a base material and a weld portion between the base material and the chip including first to nth weld layers formed by material of the chip and the base material, wherein the first to nth weld layers are successively arranged from a side of the base material in order of the first to nth weld layer in a distance increasing direction from the base material, each of the first to nth weld layer has at least an overlap portion with a neighbor of the first to nth weld layers, a sum of a maximum first sectional area of the first layer and section sectional areas of the second to nth weld layers at the overlap portions is 1.4 times a third sectional area of the chip, the first, second, and third sectional areas are along the end surface, and n

is a natural number more than one as claimed in claim 1. Claims 2 and 3 are allowable by virtue of their dependency.

Re claims 4 and 6: The best prior art of record discloses a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a stress releasing layer arranged on an end surface of a base material, a chip being arranged on the stress releasing layer, and a weld portion formed between the base material and the chip with materials of the base material, wherein a linear expansion coefficient of the stress releasing layer is between those of the base material and the chip. However, the prior art fails to teach or fairly suggest a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a stress releasing layer arranged on an end surface of a base material, a chip being arranged on the stress releasing layer, and a weld portion formed between the base material and the chip with materials of the base material, wherein a linear expansion coefficient of the stress releasing layer is between those of the base material and the chip, wherein a thickness  $t$  of the stress releasing layer is equal to or greater than 0.2mm and equal to or smaller than 0.6mm and the ratio of a maximum sectional area of the weld portion along the end surface to a sectional area of the chip along the end surface is greater than  $(1.4-t)/2$  as claimed in claim 4. Claim 6 is allowable by virtue of its dependency.

Re claims 8 and 10: The best prior art of record discloses a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a chip including a noble metal arranged at the end surface of a base material and a weld portion between the base material and the chip including first to  $n$ th weld layers formed

Art Unit: 2882

by material of the chip and the base material. However, the prior art fails to teach or fairly suggest a spark plug comprising: a tubular housing, a central bar electrode, a ground electrode, a chip including a noble metal arranged at the end surface of a base material and a weld portion between the base material and the chip including first to nth weld layers formed by material of the chip and the base material, wherein the first to nth weld layers are successively arranged from a side of the base material in order of the first to nth weld layer in a distance increasing direction from the base material, each of the first to nth weld layer has at least an overlap portion with a neighbor of the first to nth weld layers, a sum of a maximum first sectional area of the first layer and sectional areas of the second to nth weld layers at the overlap portions is 1.4 times a third sectional area of the chip, the first, second, and third sectional areas are along the end surface, and n is a natural number more than one, and wherein the weld portion includes first and second ring shape layers, the first layer being arranged between a portion of the end surface of the base material and the stress releasing layer to fix the stress releasing layer to the base material, the second ring shape layer is arranged between the chip and the stress releasing layer to fix the chip to the stress releasing layer as claimed in claim 8. Claim 10 is allowable by virtue of its dependency.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Keaney whose telephone number is (571)272-2489. The examiner can normally be reached on Monday-Thursday 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
emk

  
DAVID V. BRUCE  
PRIMARY EXAMINER